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ABSTRACT

A study examined adult low-literate readers' knowledge of their cognitive skills. By better knowing this clientele from both the cognitive and metacognitive angles, several objectives could be met, including remedying a lack of knowledge in their assessment, and building a valid curriculum content closer to their needs. Many studies suggest that a metacognitive approach can give better results than an approach based solely on the mastery of cognitive competencies. The five female and four male low-literate readers studied (in Quebec) obtained scores below the norm on the digit span memory test, confirming some psycholinguistic hypotheses. Short-term memory has a limited retention capacity and processes information mainly in a phonological way. The fact that good readers generally decode well helps short-term information processing. Faster word processing avoids an overload in short-term memory. Conversely, the beginning reader who decodes with difficulties rapidly clutters his or her short-term memory, which impairs comprehension. Data on metacognitive comprehension shows that few low-literate readers are aware of the relation between reading comprehension and decoding skills. Literate persons (such as the seven men and four women in a control group) establish this link more easily. In spite of these cognitive limitations, low-literate and literate readers do share some metacognitive knowledge. Two tables and a list of tasks and cognitive skills are included. (Contains 38 references.)
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Hélène Poissant
Lehman College, CUNY

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Center for the Study of Reading

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Abstract

This study examined low-literate readers' knowledge of their cognitive skills. By better knowing this clientele from both the cognitive and metacognitive angles, we had several objectives, including to remedy a lack of knowledge in their assessment, and to build a valid curriculum content closer to their needs. Many studies suggest that a metacognitive approach can give better results than an approach based solely on the mastery of cognitive competencies. We observed that low-literate readers obtained scores below the norm on the digit span memory test. This confirmed some psycholinguistic hypotheses. Short-term memory has a limited retention capacity and processes information mainly in a phonological way. The fact that good readers generally decode well helps short-term information processing. A faster word processing avoids an overload in short-term memory.

Conversely, the beginning reader who decodes with difficulties rapidly clutters his or her short-term memory, which impairs comprehension. Our data on metacognitive conceptions show that few low-literate readers are aware of the relation between reading comprehension and decoding skills. Literate persons establish this link more easily. In spite of these cognitive limitations, low-literate and literate readers do share some metacognitive knowledge.

ASSESSING AND UNDERSTANDING THE COGNITIVE AND METACOGNITIVE PERSPECTIVES OF ADULTS WHO ARE POOR READERS

One of the first problems raised when dealing with illiteracy is to find a precise definition. However, most authors agree that social context is an essential component which must be considered in any conception of illiteracy. In fact, illiteracy is a more crucial problem in societies such as ours, where written language is dominant. In our technological society where most information is channeled through writing, low-literate people frequently encounter problems which, ultimately, lead to difficulties in social integration. These difficulties start very early in life. Most of the time, parents of low literates can neither read nor write, and therefore cannot help their children in their school work. Furthermore, this population comes mostly from lower socioeconomic classes, in which language, values, and ways of living differ from those of school. Delayed learning is then detected during the first years of schooling, so children are directed toward special classes in which all kinds of "deviationists" are placed: children with learning disabilities, dyslexic children, children with behavioral and emotional problems, and so forth. Of these children, only a fraction will reach high school. For the others, finding a job, going through interviews, filling out forms, and keeping a job will be daily struggles. The low-literate adult is then confined to isolation and to a greatly restricted world.

It is estimated that there are thousands of low literates in Quebec, Canada. According to a survey, roughly a quarter of a million of Quebec inhabitants age 15 and up have some kind of reading or writing difficulties (Maheu & Saint-Germain, 1984). Of these, a minority is completely illiterate, which means that these persons *can neither read nor write or can only recognize their names*. The others, the functional illiterates, *can identify letters of the alphabet but are unable to assemble them to form syllables or words*. These are the numbers officially approved by the ministry of Education of Quebec. In educational research, the definition of illiteracy is based on the number of years of formal schooling achieved: A low-literate person is one who *attended school for less than 5 years*. This is the length of time necessary to acquire basic skills in reading and writing (Pinard, Lefebvre-Pinard, & Bibeau, 1989). A preferable definition has been put forth by UNESCO which goes beyond a purely linguistic conception to acknowledge the fundamental cognitive process of comprehension. According to this organization, a person is considered low literate when he or she *can neither read nor write nor understand a short, simple presentation of facts that relate to everyday life.*

From the instructors we have met during the elaboration of our curriculum (Poissant, Falardeau, & Poellhuber, 1993a), we learned that few psychological data exist that describe low-literate people. In general, only reading and writing are assessed. Therefore, these instructors find themselves in heterogeneous classes, gathering people with various levels of learning and language disabilities, people with minor mental deficiencies due to real or supposed neurological problems, people with minor behavioral troubles, and immigrants.

In parallel to the elaboration of our program, we conducted a study on the knowledge of low-literate people regarding different cognitive skills. We had several objectives in learning more about this clientele from both the cognitive and metacognitive angles: to remedy a lack of knowledge in their assessment and to build a valid content closer to their needs. In addition, many studies suggest that a metacognitive approach can give better results than an approach based solely on the mastery of cognitive competencies (Bransford, Sherwood, Vye, & Rieser, 1986; Peterson & Swing, 1983; Torgesen, 1977). Literature on the development of cognitive skills highlights the fact that training in thinking skills benefits learning. Therefore, we have designed our curriculum on the basic idea that it is desirable to have knowledge about strategies and their regulation to better react in various learning situations.

Metacognition and the Development of Cognitive Skills

The term *metacognition* first appeared in scientific literature in the late 1970s. Since then, it has given rise to several theoretical frameworks, including those that integrate the concept of *self-regulation* represented mostly by the latest development of the Piagetian school. Generally, the concept of metacognition is used to designate both the *knowledge* of cognition and the *regulation* of this knowledge (Brown, 1987; Flavell, 1979; Davidson & Sternberg, 1984).

Most metacognitive knowledge centers on the interaction between the *individual*, the *task*, and the *strategies* (Flavell, 1979; Pinard et al., 1989). The regulation part comes from what Flavell refers to as *metacognitive experiences*, that is, thoughts, impressions, and feelings that arise during a cognitive experience. These experiences happen mostly when an individual is confronted with a problem (Bouffard-Bouchard, 1987; Flavell, 1979; Lebfevre-Pinard & Pinard, 1985). As awareness, they play a role as internal retroaction which informs the individual on the value and the progress of its own mental process. The self-regulation component can thus be conceived as an *active knowledge*.

Numerous authors have tried to establish a theoretical link between metacognition, its training, and intellectual performance. As such, Torgesen (1977) attributes the poor performance of subjects with learning difficulties to metacognitive deficiencies rather than to cognitive ones. Individuals with academic difficulties are assumed to be less capable at using metacognitive processes. According to Peterson, Swing, and Buss (1982), gifted students reported the use of specific cognitive strategies more often than the less gifted ones. Less gifted children would try less often to correct their mistakes, because of an inefficient cognitive regulation. These "defects" of regulation can theoretically happen in any individual, but are more likely among the youngest and the poor readers (Garner & Alexander, 1989). Thus, beginning learners have difficulties in recognizing that they did not learn or act adequately (Bransford et al., in Redding, 1990). Many studies demonstrate also that poor readers lack strategies to grasp the meaning of a text and "regulate" their comprehension (Brown, Armbruster, & Baker, 1986; Gambrell & Heathington, 1981; Paris & Myers, 1981; Paris, Wasik, & Van der Westhuizen, 1987). Good readers understand the importance of making sense when reading, whereas poor ones limit themselves to decoding tasks (Garner & Kraus, 1981; 1982).

Individual differences in performance seem, then, to depend on the metacognitive skills of the persons. However, the fact that one has knowledge of strategies and their regulation does not always guarantee their use. For example, some useful knowledge is not always activated in problem-solving situations (Bransford et al., in Redding, 1990). Therefore, it is also important to be able to link a new knowledge with previous ones to ease access to and utilization of metacognitive knowledge (deGroot, 1965; Gick & Holyoak, 1980; Redding, 1990). Learning is improved when one can refer to *prior knowledge* in order to understand new informations or new problems. The amount of information one has in a particular domain, and the organization and the accessibility of this information, are just a few of the many factors that affect performance (see Garner & Alexander, 1989).

According to several authors, metacognitive training can benefit some problem-solving tasks during the actual use of the strategies, if the instructions are given in an explicit manner (Bereiter & Scardamalia, 1985; Bransford, et al., 1986): The learners must understand why a strategy works in a given situation, in order to use it adequately (Frederickson, 1984). The metacognitive components thus appear as important factors of mediation in the development of intellectual abilities. Moreover, these components can be taught in a program with a certain degree of efficiency.

Metacognition and Literacy Level: The Case of Low-Literate Persons

Studies on metacognition and low-literate persons are few, except for those of Gambrell and Heathington (1981), and Fagan (1988) on reading and writing, and Pinard et al. (1989) on

comprehension. The latter authors explore the two main elements of metacognition: metacognitive knowledge and its regulation in the comprehension of oral communication. In their study, the participants were asked questions on their knowledge relative to *individuals* (e.g., Does everyone understand the same way?), to *tasks* (e.g., What does it mean to understand what someone says?), and to *strategies* (e.g., By what means do you verify that you understood well?). The results indicate that almost all subjects, control and low-literate groups, admit to the difference between and within individuals (knowledge on individuals). Significant differences between groups are observed, however, regarding the tasks. While the literate subjects accurately define what is comprehension, almost half of the low-literate subjects confuse comprehension with hearing or memorization. However, both groups agree on the progressive nature of comprehension. Finally, results do not show any differences between groups as to the knowledge of strategies. Strategies generally used to evaluate the level of comprehension are *self-regulation*, the *search for feedback* from someone else, and the *search for additional information*. In addition, to improve comprehension, both groups resort to the speaker, to an increase in attention, and to analysis of environmental factors.

Overall, their results indicate that the low-literate subjects acquired some knowledge of comprehension similar to that of literate subjects. There are differences, however, as to the cause of the difficulties in comprehension. The low-literate subjects trace incomprehension to the vocabulary used or to the characteristics of the speaker (e.g., accents or speed). The literate subjects prefer to blame the structure of the message or the level of reasoning required for comprehension. This difference could be, according to Pinard et al. (1989), caused by a distinct definition of comprehension by both groups. The attention focused on the most peripheral aspects of the message (by trying to decode rather than to comprehend) shows that low-literate readers behave like beginning readers in some aspects.

Method

Subjects

The literate control group consisted of 7 men and 4 women between the ages of 26 and 47, while the low-literate group comprised 5 men and 4 women between the ages of 22 and 48. All members of the first group went to high school, and two of them received a diploma from a vocational college. The members of the low-literacy group reached a schooling level between first and sixth grade, except for two who have been enrolled for a limited time at the high school level. All members of the control group were students or were working at the time of the evaluation. Only two low-literate adults were employed at that time, and all were enrolled in an adult basic education program offering reading and writing classes at levels corresponding to the first four grades. Both groups came from the low and middle socioeconomic classes, and presented no important health problems (except for one low-literate subject diagnosed with epilepsy).

Evaluation Protocol

Both groups were assessed following a dozen subtests drawn mainly from the *Weschler Adult Intelligence Scale-Revised (WAIS-R)* and from the *Protocole d'Evaluation Neuropsychologique Optimal (PENO)* of Joannette, Poissant, Ska, and Fontaine (1990). In addition, they were evaluated on their metacognitive knowledge in regard to different aspects of cognition, through a questionnaire elaborated by the authors. The low-literate subjects were given the entire protocol, which lasted about 2 hours, while the control group received only 8 of the 12 subtests. We decided to do so because the low-literacy group had received high scores in 4 of the PENO subtests.

The subtests used are classified into five main categories:

1. Memory: *logical memory* (PENO) and *digit span* (WAIS-R);
2. Language: *comprehension* (PENO), *word production* (PENO), *discursive abilities* (PENO);
3. Perception: *visual discrimination* (PENO), *bell test* (PENO), *picture completion* (WAIS-R), *digit symbol* (WAIS-R);
4. Verbal abilities: *similarities* (WAIS-R), *comprehension* (WAIS-R); and
5. Metacognition.

Answers were noted by hand writing or recorded on audio cassettes (see annex 1 for a list of tasks).

Metacognitive Questions

- What does it really mean to understand what someone else is saying?
- Does everyone understand all at once or progressively?
- What means can be used to verify one's understanding? to better understand?
- What does it mean to be attentive?

  What can disturb us?
- Does everyone see or observe the same thing?

  Can someone see or observe all at once?
- How does memory work?

  How can we remember better?
- What is reading?

  What should we do in order to understand well?

  What is writing?

  What are the uses of writing?

Results

The PENO and the WAIS-R

The results (average and standard deviation) are presented in Table 1. As mentioned before, the low-literate subjects received high marks for four subtests of the PENO. Our sample have few problems on *comprehension* (Avg: 37.0, *sd*: 3.8); *word production* (Avg: 30.0, *sd*: 5.2); *visual discrimination* (Avg: 9.5, *sd*: 0.7) and *Bell test* (Avg: 34.1 *sd*: 1.6). Those results contrast with the other subtests where the low-literate subjects achieved relatively low scores.

[Insert Table 1 about here.]

Thus, in the *logical memory* subtest, for which one must retell a short story that was just read, only a third of the key information is recollected (Avg: 7.9, *sd*: 2.7), whereas the control group recalled more than half (Avg: 12.4, *sd*: 3.7). On the *digit span*, the low-literate subjects received an average score of 4.1, which corresponds to a performance clearly under the norm of 10 of the WAIS-R. The control group scored close to the standard, with an average of 10.1.

The low-literate subjects also performed poorly on the *discursive abilities* subtests. They recounted about a third of the key information (Avg: 7.7, *sd*: 5.6) when they were asked to tell the familiar story of *Little Red Riding Hood.* Their scores went up when they explained how to make a *sandwich* (Avg: 5.2, *sd*: 2.0). Finally, when asked to tell a story based on a picture of a *bank holdup*, they gave only half of the relevant information relating to the story (Avg: 5.2, *sd*: 1.5). On each of the three subtests, the control group scored, respectively, Avg: 11.3, *sd*: 5.3; Avg: 6.5, *sd*: 1.2; and Avg: 7.3, *sd*: 09.

At the *perception* level, the low-literate subjects also received scores lower than those of the control group on the *picture completion* and *digit symbol* subtests of the WAIS-R: Avg: 8.3, *sd*: 2.5, and Avg: 6.8, *sd*: 1.4. But, surprisingly, the control group also performed below the norm, Avg: 9.8, *sd*: 2.2 and Avg: 8.8, *sd*: 2.2.

Finally, in the *verbal abilities* measured by *similarities* and *comprehension* subtests, the low-literate subjects received scores lower than those of the control group and the WAIS-R norms. Their average scores rated 9.2, *sd*: 3.9 and 7.6, *sd*: 2.1, as opposed to the 11.5, *sd*: 2.7 and 10.8, *sd*: 1.9 scores of the control group for the two subtests. Thus, the low-literate subjects scored lower than both the norms of the WAIS-R subtests and the control group scores. In this respect, the digit span test seems the most discriminating.

Metacognition

In this instance, the questions regarding metacognition are concerned with different cognitive functions: *comprehension, attention, observation*, *memory*, as well as *reading* and *writing*. In this section, the results will be presented qualitatively due to the importance of the variance in the length and number of responses between groups. We observed a notable and constant difference between the two groups at these levels. The low-literate subjects declined to answer questions in a significantly higher proportion than the literates. The former offered only 86% of the possible answers in their group. Adding them to the number of irrelevant answers, the proportion of admissible answers falls down to 75%. Moreover, many productions were subject to many possible categorizations of answers. This was more obvious for literate persons who showed more variety in their answers. Thus, the results are presented in frequencies of answers corresponding to one or another *a posteriori* categories (see table 2).

[Insert Table 2 about here.]

Regarding *comprehension* we realized that low-literate persons, for the largest part, have a tendency to give *peripheral* definitions. For the majority, to understand is equivalent to "hearing sounds." The definitions given by two of them were unsatisfactory. For literate persons, the definition of comprehension is evenly shared between its being an activity linked to *listening* and *meaning* ("Understanding the meaning of what someone thinks when he is talking to you"), and on a lesser level, one linked to empathy ("To comprehend is to be on the same wavelength"). These results partially replicate those of Pinard et al. (1989), which stated that low-literate persons tend to relate verbal comprehension to hearing. On the other hand, both groups, with the exception of one low literate who did not answer this question, agreed to consider comprehension as a progressive phenomenon ("It happens by linking elements together"). Comprehension would depend mostly on the contents of

apprenticeship and the person ("you may understand one thing easier than I may, and I do another thing easier than you"). Thus, our results matched those of the previous authors, mainly that adults do recognize the progressive aspect of comprehension and its links to, within, and between individual factors. To verify or improve their comprehension, all respondents use primarily the *help of a third party* and the *reformulating of the message* ("to say it another way to know if he interprets it the same way, if it means the same as what the other has originally said"). *Testing* ("the teacher explains one thing, . . . you do it, and then you see if that works out") and *external aid* are also cited evenly by the control group as means of verification. *Self-regulation* means such as *studying, reading and writing* were mentioned by both groups, but to a greater extend by low-literate subjects. We obtained results similar to Pinard et al. (1989) relating to knowledge on strategies. There are few differences between the subjects as to means employed to verify or improve understanding. We do observe, however, that the literate subjects had a wider set of means to improve their comprehension.

Respondents from both groups provided answers mainly translating *attention* as *"to concentrate."* For the subjects of the control group, *attention* is also often associated with other psycho-physiological states such as *"to be listening"* and *"alert."* The less literate subjects tended mostly to mention external factors as sources of distraction ("someone is knocking at the door"). Internal sources of disturbance can be *wariness, thoughts* and *personal problems*. For the control group, *external* and *internal* factors were evenly spread. Two subjects from the low-literate group could not define attention, and another one could not provide a satisfying answer. Furthermore, one member of this group could not identify any distractors.

Except for one person of the low-literate group who did not answer, all respondents agreed that we can not all have the same *observations* ("you have a painting, you look this way, you see one thing, another person sees something else"; "We are not all necessarily attracted to the same things"). Thus, it depends mostly on *between subjects* variables such as taste or experience. Both groups also agreed that *one cannot see or observe all at once*. For the control group, it is so because of one's own limits as *individuals*, such as the impossibility of being everywhere at a time. For the few respondents of the low-literate group (3 people did not respond and 1 did affirmatively), it depends mostly on the *external criteria* such as the size of the objects. When we compare these results to those obtained by Pinard et al. (1989) on comprehension, one finds similarities. Observation (our study), just as comprehension (our and Pinard et al. studies), is perceived as dependent on the between-individuals variable and as being a progressive phenomenon.

Memory apparently works differently, depending on which group one belongs to. Low-literate subjects preferred to define the working of memory in terms of a *recording medium* (photography, printing, taping). Control-group subjects preferred the use of *spatial metaphors* ("the items are in the drawer but you must open it. . . If you cannot look for them, it means your memory is bad"). Both groups also used *computer metaphors* ("Memory works like a computer"). Two subjects of the low-literate group could not, however, define the working of memory, while 2 others offered inappropriate answers. In addition, subjects located memory in the *brain* and mentioned the role of the *senses* such as like sight and hearing ("that's what you hear and your brain records it"; "the eyes reflect your memory"), although this occurred to a lesser extent for the low-literate group. The means used to improve memory were similar for both groups. These were mostly *self-regulation* means such as rehearsal ("It is like a phone number, if you dial it often, you can never forget it . . . you did it so many times that it is automatic, it is deeply rooted there") and reading, writing, and studying. The control group added some aids relating to *cognitive abilities* such as observation, concentration, attention, motivation, and visualization. Thus again, there seem to be no major differences between the types of self-regulation strategies used by both groups. However, the low-literate group came up with fewer answers, with one irrelevant and one missing answer.

The concept of *reading* is somewhat different for each group. For the 6 low-literate subjects who provided a satisfactory answer, reading is mostly a *comprehension* activity and to a lesser extent a

decoding activity ("align words in such a way that it is stylish"). For the literate subjects, reading is evenly a way of *acquiring knowledge* ("broaden our knowledge"; "educate oneself") and a *decoding* activity ("decipher a series of letters, words and sentences"). But reading rarely assimilates comprehension. For both groups, the high-level processes involved in improving reading comprehension referred mainly to *self-regulation*, though to a lesser extent for low literates. Among the self-regulation means were *rereading, slow reading, asking yourself questions,* and *analyzing*. These processes are mentioned in the majority of answers of the control group. Many answers from the control group also referred to the need to be *attentive* and to *concentrate*, while this is mentioned only once by the low-literate group. Sometimes *external help* was sought by both groups ("looking up words in the dictionary"). Self-regulation is therefore mentioned by both groups as a strategy to improve reading comprehension.

On the other hand, there are important differences between the two groups regarding the definition of *writing*. Among the 7 low-literate subjects who gave an answer, 5 answered by offering an estimate of their *personal performance* ("It's very hard for me to write"). One answered that writing is "to adjust sounds so that they become words." Such a definition corresponds to *encoding*. The answers from the control group are more mixed. They come out in equal proportions *to translate thoughts or knowledge, to communicate a message* ("writing to someone means you tell him something not by speaking to him but on paper"), and *handwriting* ("to write is to take a pencil, a piece of paper and put down words"; "make forms, lines, letters put together to form words"). For the first time, a person from the control group did not answer. Finally, while the low-literate subjects put mostly an *instrumental value* on writing ("to write a check"; "to draw up a list"), the literate ones considered it more as a means to *communication* ("engage in relationship with others"; "express to others what one feels like telling") or a *conservation* means ("to preserve things so that they would not be forgotten").

Discussion

First, we observed that low-literate subjects obtained scores below the norm on the digit span memory test (WAIS-R). This confirmed the *bottleneck hypothesis* invoked by Perfetti (1985), Perfetti and Goldman (1976), and Perfetti and Hogaboam (1975) to explain differences between good and poor readers. Short-term memory has a limited retention capacity (one or two minutes) and processes information mainly in a phonological way (Shankweiler & Crain, 1987). The fact that good readers generally decode well helps short-term information processing. A faster processing of words avoids an overload in short-term memory. Conversely, a beginning reader who decodes with difficulties rapidly clutters his or her short-term memory. The size of the information chunks is considerably shortened. Such readers quickly forget what they have just processed, which impairs comprehension. In our study, we presume that decoding difficulties of low-literate readers are amplified by limited mnemonic skills, which in turn, lower understanding. Furthermore, our data on metacognitive conceptions show that few low-literate readers are aware of the relation between reading comprehension and decoding skills. Literate readers establish this link more easily. On the other hand, the low-literates do see the link in the case of verbal comprehension (see question 1 of the metacognitive questionnaire). This knowledge at the verbal level of comprehension could possibly be transferred to the reading comprehension level through adequate metacognitive instructions.

One other difficulty for the beginning reader is in processing complex sentences. The low-literate readers seemed to have problems understanding some complex syntactic structures such as passive sentences and relatives clauses. This confirms the research of Mann, Shankweiler, and Smith (1984) on the syntactic knowledge of poor readers. According to Shankweiler and Crain (1987), this problem can be linked to the short-term memory deficiency found in these people. Reading difficulties are not only related to linguistic factors, such as syntactic delay, but also to the short-term memory functioning impairment.

Mann, Liberman, and Shankweiler (1980) studies on short-term memory demonstrate that good readers use rehearsal as mnemonic strategy more often than do poor readers. Our own data on metacognition seem to confirm this, because literate people report using repetition as a mean of self-regulation to better remember information. However, low-literate readers also invoke this strategy. In fact, the difference between both kind of readers may reside mostly in the effectiveness of this strategy or in the fact that it may or may not be used.

Low-literate readers seemed less skilled at verbally expressing themselves. They forget important information when asked to recount verbally a familiar short story (e.g., "Little Red Riding Hood"). These limitations can account for the differences between this group and the literate group in the length and the variety of answers on the metacognitive test. Low-literate readers provided fewer answers and in less variety, due possibly to their verbal limitations. These limitations, combined with short- and long-term memory deficits, can also explain the low performance on the logical memory test (PENO). This task refers to the ability to *reproduce* a story from memory following a logical sequence, and so, differs from the other discursive tasks that appeal to *production* ability. In the former task, the cognitive processes referred to several aspects, including serial and reasoning skills. In the latter case, the person needs also to make an efficient use of his or her prior knowledge stored in long-term memory. The encountered difficulties could, in this case and probably to a lesser extent in the reproduction case, come from a difficulty in accessing prior knowledge, as suggested by Oakhill and Garnham (1988).

Low-literate readers sometimes face problems when they are trying to establish similarities between concepts. This can be linked to previous observations of Perfetti and Lesgold (1979) in the sense that gifted readers are better at categorizing tasks. They have a better access to semantic memory information, therefore, they can decide if a specific word belongs to a category.

Our present data are convergent with previous results relating mnemonic deficits with reading difficulties. However, this limitation cannot solely account for the overall performance of low-literate readers (Oakhill & Garnham, 1988). It appears that the reading problems encountered by poor readers are rooted in a constellation of factors. Our study was an attempt to discover a few of them.

Conclusion

In spite of these cognitive limitations, low-literate and literate readers do share some metacognitive knowledge. This knowledge would refer to the strategies used to verify comprehension, to better remember or better comprehend a text. However, the effective application of these strategies can be distinct from metacognitive knowledge. Individuals may have an exact knowledge of the strategies to solve a given task without being able to use it. Low-literate readers differ from literate ones mostly in their knowledge of the definition of *comprehension, reading,* and *writing tasks*. They tend to consider the comprehension of oral communication in terms of hearing, although their conception of reading is often close to comprehension. Very few low-literate subjects provided a satisfactory answer to the task of writing, which denotes some problem at this level.

From these results, it appears important to develop training programs with an emphasis on metacognitive strategies and awareness. Poissant, Falardeau, and Poellhuber (1993a, b) had this in mind during the elaboration of their program intended for low-literate adults.

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APPENDIX 1

TASKS AND COGNITIVE SKILLS

Memory

1. Logical Memory (PENO from WECHLER, 1969): Immediate memory of discourse
2. Digit Span (WAIS-R): Immediate memory of string of digit; Attention

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Language (PENO)

3. Comprehension: Phonology; semantic; visual perception; syntax
4. Word Production: Lexical access

Discursive abilities (PENO)

5a. "Red Riding Hood": narrative coherence, long term memory

5b. "Sandwich": procedural coherence, long term memory

5c. "Bank Holdup": narrative coherence with picture support, long term memory

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Perception

6. Visual discrimination (PENO and Montreal-Toulouse Protocol): visuo-spatial
7. Bell Test (PENO, Gauthier et al. 1989): visual research strategy
8. Picture completion (WAIS-R): observation; visual concentration
9. Digit symbol (WAIS-R): attention; concentration with a time constraint of 2 minutes.

Verbal abilities (WAIS-R)

10. Similarities: abstraction; relation between concepts
11. Comprehension: judgment; knowledge organization; abstraction; verbalization

Table 1

Average Scores (SD) for Low Literate (n=9) and Control (n=11)

Tasks	Low Literate	Control
Memory		
1. Logical M.(/24) (PENO)	7.9 (2.7)	12.4 (3.7)
2. Digit Span (/10) (WAIS-R)	4.1 (1.9)	10.1 (3.3)
Language (PENO)		
3. Comprehension (/42)	37 (3.8)	--
4. Word Production (/31)	30 (5.2)	--
Discursive abilities (PENO)		
5a. "Red Riding Hood"(/22)	7.7 (5.6)	11.3 (5.3)
5b. "Sandwich" (/9)	5.2 (2.0)	6.5 (1.2)
5c. "Bank Holdup" (/10)	5.2 (1.5)	7.3 (0.9)
Perception		
6. Visual discrimination (/10) (PENO)	9.5 (0.7)	--
7. Bell Test (/35) (PENO)	34.1 (1.6)	--
8. Picture completion (/10) (WAIS-R)	8.3 (2.5)	9.8 (2.2)
9. Digit symbol (/10) (WAIS-R)	6.8 (1.4)	8.8 (2.2)
Verbal abilities (WAIS-R)		
10. Similarities (/10)	9.2 (3.9)	11.5 (2.7)
11. Comprehension(/10)	7.6 (2.1)	10.8 (1.9)

Table 2

Frequencies of Subjects' Answers for the Metacognitive Task (1st row = low literate, 2nd row = control)

Metacognitive Questions

Q1: What does it really mean to comprehend what someone else is saying?

Hearing	Compreh.	Listening	Empathy	NonSatisf.
5	2	-	-	2
-	9	7	4	-

Q2: Does everyone understand all at once or progressively?

All at once	Progress	No Answer
-	8	1
-	11	-

Q3: What means can be used to verify one's comprehension? To better comprehend?

Help from other	Reform	Self-regul.	Ext. Aid	Testing
5	4	5	-	1
5	5	2	4	4

Q4: What does it mean to be attentive?

Concentrate	Listen	Alertness	NonSatisf.	No Answer
6	2	1	1	2
8	7	5	-	

Q4a: What can disturb us?

Ext. Factors	Int. Factors	Motivation	NonSatisf.
7	3	-	1
10	12	1	-

Q5: Does everyone see or observe the same thing?

Between-subject Diff.	No Between sub. Diff.	No Answer
8	-	1
11	-	-

Q5a: Can someone see or observe all at once?

All at once	Progressively	No Answer
1	5	3
-	11	-

Q6: How does memory work?

Computer	Space	Record	NonSatisf.	No Answer
2	-	4	2	2
3	6	2	-	

Q6a: How can we remember better?

Self-Regulation	Observation	Ext. Aid.	NonSatisf.	No Answer
10	2	-	1	1
15	9	1	-	

Q7: What is reading?

Decoding	Compreh.	Knowled.	Communic.	NonSatisf	No Answer
2	4	1	-	2	1
7	1	6	2	-	

Q7a: What should we do in order to understand well when we read?

Self-Regul.	Attention	Decoding	Ext. Aid	NonSatisf	No Answer
4	1	2	2	1	1
7	8	-	2	-	

Q7b: What is writing?

Encode	Handwr.	Commu.	Conserv.	NonSatisf	No Answer
1	-	-	1	5	2
4	4	4	-	2	1

Q7c: What are the uses of writing?

Instrument.	Learning	Commu.	Conserv.	NonSatisf.	No Answer
7	2	3	1	1	1
3	-	6	5	-	